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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/825,882

04/17/2004

Eric T. Martin

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EXAMINER

DEB, ANJAN K

ART UNIT

PAPER NUMBER

2858

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/825,882	Applicant(s) MARTIN ET AL.	
	Examiner Anjan K. Deb	Art Unit 2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☒ Claim(s) 26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim 26 is objected to because of the following informalities: Should depend from claim 25. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1,2, 19, 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Ziv et al. (US 4,918,390 A).

Re claim 1, 19 Ziv et al. discloses method and system comprising micro-electromechanical (MEM) device assemblies (T1, T2..Tn) capable of individually written to (switch S1, S2, ...Sn have binary state (inherent)) and testing device (see Test Mode, Fig. 1) for testing device assembly for proper operation (continuity) without directly reading the MEM device (S1, S2, ...Sn) of the MEM device assemblies (T1, T2..Tn). The electrical switches (S1, S2, ...Sn) actuated by sensors are broadly interpreted as micro-electromechanical device absent specific structure of the claimed MEM device.

Re claim 2, 20 Ziv et al. disclose testing mechanism is capable of verifying that an electrical path exists (continuity testing) through each MEM device.

4. Claims 1-10, 12-20, 22, are rejected under 35 U.S.C. 102(b) as being anticipated by Staple et al. (US 6,750,655 B2).

Re claim 1, 19 Staple discloses system and method comprising micro-electromechanical (MEM) device assemblies (614)(Fig. 6A,B) capable of individually written to (charging capacitor of each MEM being driven by driver 604), and testing device (AC Detector)(612)(Fig. 6A) for testing device assembly for proper operation (affirming switched status of MEMS-based devices) (continuity sensing)(column 6 line 43 to column 7 line 6) without directly reading the MEM device of the MEM device assemblies (614).

Re claim 2, 20 Staple discloses testing mechanism is capable of verifying that an electrical path exists (continuity sensing)(column 6 line 43 to column 7 line 6).

Re claims 4, 5, Staple discloses first switch (driver)(604) coupling a column control signal to the MEM device 610 and a second switch 618 coupling a clear voltage to the MEM device wherein each of the first and second switch is a transistor.

Re claims 6,7, 18, 22 Staple discloses light modulation MEM device (optical attenuators, switches, signal modulators) used in projection system (display devices) (column 8 lines 50-57).

Re claims 3, 8-10, 17 Staple discloses row and column control mechanism comprising driver 604, and transistor 618 (column 7 line 54 to column 8 line 50).

Re claims 12-16, Staple discloses system comprising an array of nodes organized into rows and columns, each node having a micro-electromechanical (MEM) device incapable of being electrically read, a first switch (driver) coupling a column line to the MEM device and a second switch (618) coupling a clear voltage to the MEM device, and a testing mechanism (612) situated outside of the array of nodes to test each node for proper operation by selecting a row and a column of the nodes in which the node is located to turn on the first and the second switches of the node and by verifying that an electrical path exists (continuity sensing)(column 6 line 43 to column 7 line 6) from the column, and through the first (driver) and the second switches (618), to the clear voltage. Digital driver 604 is broadly interpreted as a first switch because it is used to selectively turn on high an electrode of MEM device 614.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Staple et al.

(US 6,750,655 B2) in view of Montrose (US 20040257086 A1).

Re claim 11, Staple disclosed all of the claimed limitations as stated above except a multiplexer.

Montrose discloses test circuit for MEM device comprising multiplexer 70 configured to provide the analog readback to a corresponding activation driver or switch driver (para 0008) (Fig. 2).

At the time the invention was made it would have been obvious for one of ordinary skill in the art to modify Staple by adding multiplexer disclosed by Montrose to provide the analog readback to a corresponding activation driver or switch driver.

7. Claims 21, 23-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Staple et al.

(US 6,750,655 B2) in view of Martin (US 20040218334).

Re claims 21, 23, 25, 27, Staple discloses all of the claimed limitations including charging a column of the array of MEM device 610, situating a testing device 612 outside array of nodes comprising MEM device 610, verifying proper operation of one MEM device, source of

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second transistor 618 connected to clear voltage (MEM select state is off)(capacitor 614,616 voltage) except:

re claims 23, 27 a first transistor having source connected to column of the array and drain of the first transistor is connected to drain of a second transistor of the MEM device;

re claims 21,25, turning off one or more columns of the array of MEM device assemblies, and verifying one or more columns of the array properly discharged the charge.

Martin discloses MEM devices, for light modulator array utilizing diffraction-based digital light devices (DLDs), comprising first 62 and second 64 transistor for controlling MEM devices using a variable capacitor to modulate light, wherein each update cycle requires draining a charge (discharged the charge) based on control data of a prior update cycle from the MEMS device to place the MEMS device in a known charge state before adding an appropriate charge based on control data of a present update cycle (para 0005) (Fig. 2).

At the time the invention was made it would have been obvious for one of ordinary skill in the art to modify Staple by adding a first transistor disclosed by Martin and having the first transistor source connected to column of the array and having the drain of the second transistor connected to drain of second transistor of the MEM device as required for draining a charge based on control data of a prior update cycle from the MEMS device to place the MEMS device in a known charge state before adding an appropriate charge based on control data of a present update cycle for properly controlling the MEM device in digital light devices (DLDs) application as disclosed by Martin.

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Re claims 24, 26 Staple combined with Martin did not explicitly disclose repeating the method for each successive column of the columns of the array and for each successive row of the row of array but would have been obvious for testing the array of MEM devices.

At the time the invention was made it would have been obvious for one of ordinary skill in the art to modify Staple as modified by Martin by repeating the method for each successive column of the columns of the array and for each successive row of the row of array for testing the array of MEM devices.

Re claim 28, Staple disclosed capacitance $C^{(1)}, C^{(2)}, \dots C^{(L)}$ is sensed by field-effect transistor 618 (column 8 lines 1-50) but did not explicitly disclose verifying that each row of the nodes is able to discharge each column of the nodes to the clear voltage upon the column of the nodes having initially been charged.

Martin discloses the need for draining a charge so as to place the MEMS device in a known charge state before adding an appropriate charge based on control data of a present update cycle for properly controlling the MEM device in digital light devices (DLDs) application.

At the time the invention was made it would have been obvious for one of ordinary skill in the art to modify Staple by adding the step of draining a charge disclosed by Martin so as to place the MEMS device in a known charge state before adding an appropriate charge based on control data of a present update cycle for properly controlling the MEM device in digital light devices (DLDs) application.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

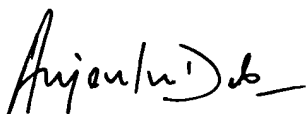
Starkweather (US 6,775,048 B1) discloses micro-electrical mechanical structure (MEMS) device for optical modulator and optical display system.

Hughes (US 20020120887) discloses testing memory array comprising multiplexer.

Anderson et al. (US 6,600,591 B2) discloses MEM array device comprising digital driver 416 to selectively turn on a selected electrode of MEM array to the "high" state (Fig. 4).

Contact Information

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Anjan K. Deb whose telephone number is 571-272-2228. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lefkowitz Edwards can be reached at 571-272-2180.



Anjan K. Deb

Patent Examiner

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7/9/05

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